REMARKS

Claims 1-4, 6-19, 22, and 24-26, 28-29 and 31-32 are pending in the application and have been examined. By this Amendment, claim 1 is canceled without prejudice or disclaimer and claim 2 is amended. The Office Action objected to the Specification under 35 U.S.C. § 112, first paragraph, as allegedly failing to provide an adequate written description of the invention and allegedly failing to provide an enabling disclosure. Applicant respectfully traverses this objection.

The Office Action rejected claims 1-4, 6-19, 22, 24-26, 28-29 and 31-32 under 35 U.S.C. § 101 as allegedly inoperative and therefore lacking utility for the same reasons that the Specification was objected to under 35 U.S.C. § 112, first paragraph. (Office Action at 13.) Applicant respectfully traverses this rejection.

The Office Action also rejected claims 1-4, 6-19, 22, 24-26, 28-29 and 31-32 under 35 U.S.C. § 112, first paragraph, asserting that the Specification does not describe the claimed invention in such a way as to enable one skilled in the art to make and/or use the invention. This rejection is respectfully traversed.

In the Office Action, the same (or substantially the same) bases are asserted for objection to the Specification under 35 U.S.C. § 112, first paragraph, rejection of the claims under 35 U.S.C. § 112, first paragraph, and rejection of the claims under 35 U.S.C. § 101. Accordingly, Applicant will respond to the objection under 35 U.S.C. § 112, first paragraph, and the rejections under 35 U.S.C. §§ 101 and 112 together. Applicant respectfully traverses the § 112 objection and §§ 101 and 112 rejections for the reasons discussed below.

The Applicant notes that the § 112 objection and §§ 101 and 112 rejections are based on the following assertions in the Office Action: (1) the Applicant's invention falls within the definition of "cold fusion" attempted by Fleischmann and Pons ("F and P"); (2) there is no disclosure justifying that fractional values of n would be "allowed" in hydrogen and/or deuterium atoms; (3) there is no basis for asserting that the effective nuclear charge becomes Z/n in excited and sub-ground states; and (4) there is no basis for asserting that catalysts such as rubidium, titanium and potassium ions can act as catalysts to induce transitions in hydrogen and/or deuterium atoms into sub-ground states. Accordingly, Applicant will address these assertions.

First, the so-called "cold fusion" approach of F and P, in which deuterium atoms have been induced to tunnel into the crystal lattice of a metal such as palladium during electrolysis, is not the subject of the claimed invention. F and P claimed that light nuclei could be fused together as a result of this "tunneling," overcoming the repulsive electrostatic force between the nuclei. As stated in the Specification, "[n]o clear and unambiguous demonstration of successful cold fusion has yet been presented publicly." (Applicant's Specification at 1.)

In contrast to the "cold fusion" approach of F and P, the claimed invention enables hydrogen and/or deuterium atoms to have diminished electron path radii. The claimed invention may obtain the diminished electron path radii by reducing the hydrogen or deuterium to a sub-conventional-ground state and aligning the nuclei electrostatically such that the proton-proton separation is at a maximum. It is the alignment of the nuclei with respect to the charges in each nucleus that ultimately determines the favorable fusion path. By introducing deuterium of diminished electron-path-radius into a plasma discharge

that is confined within the water in a vessel, adjacent nuclei may experience a corresponding reduction in electric barrier, internuclear separations correspondingly become smaller, and fusion may be initiated. (Ordinarily, there is a large electric charge barrier to overcome in order to bring nuclei close enough for fusion to occur. Through the claimed invention, the electrostatic alignment may be achieved at far lower energies than those found in a thermonuclear bomb.)

Second, one of ordinary skill in the art would understand the that fractional values of n are "allowed" in hydrogen and/or deuterium atoms from either the Applicant's Specification or Mills et al. Applicant's Specification provides empirical evidence of the existence of this phenomenon. (Applicant's Specification at 10-11.) This evidence was gathered and apparently confirmed by recent studies of galactic cluster emissions by Bohringer et al. in the Scientific American, January 1999 issue. In short, that article confirmed an observed emission at a wavelength of about 30.8 nm, which corresponds to an n value of 1/2. Mills et al., in a U.S. Patent containing 94 columns, 9 drawings and 499 claims, also devotes substantial discussions to energy states below the "ground state" and below "ground state" transitions of hydrogen atoms. (See, for example, Mills et al. at Title, Abstract lines 1-18, col. 1, line 1 through col. 4, line 22; col. 14, lines 33-66.) In addition to adequately describing the existence of such energy states, no undue experimentation is required to achieve the Applicant's claimed invention. Instead, Applicant names possible electrolytes (Specification at 19-20), at least three possible catalysts (Specification at 9), and exemplary voltages usable with the claimed invention (Specification at 20). The results and data obtained in an experiment done with another embodiment of the invention further show that the invention is sufficiently described and enabled, and is useful.

(Specification at 15-16.) Indeed, that data showed that the total energy into the system was 1820.070 Joules and the total energy output was 134196.300 Joules. (Specification at 16.) Thus, in addition to simulated or predicted test results prophetical examples (paper examples), which are permitted for purposes of patent examination, Applicant has also provided working examples. (M.P.E.P. § 608.01(p) (8th ed. August 2001).)

Third, the bases for asserting that the effective nuclear charge becomes Z/n in excited and sub-ground states include the well-known relationships that exist in a resonant cavity comprising a spherical shell of charge (the electron path) located around an atomic nucleus, the Bohr radius, and a balancing of the centripetal and electric forces present in hydrogen and/or deuterium. (Specification at 4-6.)

Fourth, bases exist for asserting that catalysts such as rubidium, titanium and potassium ions can act as catalysts to induce transitions in hydrogen and/or deuterium atoms into sub-ground states. Results and data obtained in an experiment done with another embodiment of the invention show are unexplainable unless the potassium carbonate acted as a catalyst to induce transitions into sub-ground states. (Specification at 14-16.) Further, "[o]ne catalyst that has been found to initiate the transition to the a_0/n state is rubidium in the Rb+ ionic species." (Specification at 9.) This is likely as a result of the fact that the second ionization energy of rubidium is about 27.28 eV, the approximate energy of a photon emitted when a hydrogen atom goes from the "ground-state" to the $a_0/2$ state. (Specification at 7, 9.) As a result, other catalytic systems which have ionization energies approximating to [m x 27.2] eV, such as titanium in the form of Ti^{2+} ions and potassium in the form of K^+ ions. (Specification at 9.) This is confirmed when

one reviews Mills et al., at col. 6, line 23 through col. 10, line 24 and col. 15, line 65 through col. 18, line 59.

Accordingly, Applicant believes that when the Specification is viewed from the perspective of one of ordinary skill in the art, the Specification contains a sufficient written description and an enabling disclosure within the meaning of 35 U.S.C. § 112, first paragraph. Applicant's cancellation of claim 1 without prejudice or disclaimer moots the rejection of claim 1. Applicant respectfully requests withdrawal of the objection to the Specification and the rejection of claims 2-4, 6-19, 22, 24-26, 28-29 and 31-32 under 35 U.S.C. § 112.

Applicant also believes he has shown that the invention is useful within the meaning of 35 U.S.C. § 101. "To violate [35 U.S.C. §] 101 the claimed device must be totally incapable of achieving a useful result." See Brooktreee Corp. v. Advanced Micro Devices, Inc., 977 F.2d 1555, 1571 (Fed. Cir. 1992). "Situations where an invention is found to be 'inoperative' and therefore lacking in utility are rare, and rejections maintained solely on this ground by a Federal court even rarer." (M.P.E.P. § 2107.01 (8th ed. August 2001).) Given the data achieved by the Applicant, the invention is indeed capable of achieving a useful result. Contrary to the assertions in the Office Action, Applicant believes he has set forth a full example of the specific parameters of an operative embodiment. (See Specification at 14-16.) Applicant's cancellation of claim 1 without prejudice or disclaimer moots the rejection of claim 1. Applicant respectfully requests withdrawal of the rejection of claims 2-4, 6-19, 22, 24-26, 28-29 and 31-32 under 35 U.S.C. § 101.

The Office Action further rejected claims "1-3, 6, 7, 9-19, 22-25 [sic, 22, 24, 25], 28, 29 and 31" under 35 U.S.C. § 102(b) as anticipated by U.S. Pat. No. 6,024,935 to Mills et al. Applicant notes that claim 23 was part of a non-elected species (with traverse) and was therefore not examined in the Office Action. (Office Action at 2-3.) Applicant will therefore address the rejection over Mills et al. as if it were a rejection of claims 1-3, 6, 7, 9-19, 22, 24, 25, 28, 29 and 31. The Office Action also rejected claims 1, 2, 10, 13, 22, 24, 25, 28, and 29 under 35 U.S.C. § 102(b) as anticipated by U.S. Pat. No. 5,607,563 to Patterson ("Patterson-2"). Applicant's cancellation of claim 1 without prejudice or disclaimer moots the rejection of claim 1. The rejection of claims 2-3, 6, 7, 9-19, 22, 24, 25, 28, 29 and 31 are respectfully traversed. Applicant notes that Claims 4, 8, 26, and 32 were not rejected over any art of record in the Office Action.

At the time of the Office Action, claim 4 recited (in part, via its incorporation of the elements of the claims from which it depended) a method of releasing energy comprising the steps of providing an electrolyte having a catalyst therein, the catalyst being suitable for initiating transitions of hydrogen and/or deuterium atoms in the electrolyte to a sub-ground energy state, and generating a plasma discharge in the electrolyte, wherein the plasma discharge is generated by applying a voltage across electrodes in the electrolyte and wherein the applied voltage is in the range 50 to 20000V. As noted above, the Office Action did not reject this claim over any art of record.

Claim 2 recites a method of releasing energy comprising the steps of providing an electrolyte having a catalyst therein, the catalyst being suitable for initiating transitions of hydrogen and/or deuterium atoms in the electrolyte to a sub-ground energy state, and generating a plasma discharge in the electrolyte, wherein the plasma discharge is

generated by applying a voltage across electrodes in the electrolyte of at least about 50V. In conventional electrolysis techniques, low voltages of about 3 volts are used and applied continuously across the electrodes. (Specification at 2.) Mills et al. confirms this convention, as it discloses a voltage range of 1.4 to 5 volts and a preferred offset voltage of approximately 1.4 volts to 2.2 volts and a preferred peak voltage of approximately 1.5 volts to 3.75 volts, when used with the materials specified therein. (Mills et al., col. 29, lines 41-43; col. 32, lines 53-59.) Further, Patterson-2 discloses an electrolytic cell with an overall voltage across the cell of 5.0 V, a net heating voltage of 3.5 V and notes that "[i]t is well known that approximately 1.5 volts d.c. is required to accomplish [electrolysis] in a liquid electrolyte." (Col. 7, lines 1-8.)

The application of a voltage higher than that necessary to generate plasma is beneficial to the claimed process and may be typically in the range of 50V to 20000V and may preferably be between 300V and 2000V, but it also may be higher than 20000V. (Specification at 2.) For example, claim 2 recites a "method of releasing energy . . . wherein the plasma discharge is generated by applying a voltage across electrodes in the electrolyte of at least approximately 50V." Neither Mills et al. nor Patterson-2 disclose, teach or suggest the invention recited in claim 2. Additionally, none of the other art of record discloses, teaches or suggests the invention recited in claim 2. As a result, it is believed this is at least one additional critical feature or component not found in any of the references that enables Applicant's invention to function differently from any of said references so as to be able to produce a different result.

Because none of the art of record discloses, teaches or suggests the invention recited in claim 2, claim 2 is patentable over the art of record. Claims 3-4, 6-19, 22, and

24-26, 28-29 and 31-32, which directly or indirectly depend from claim 2, are patentable for these reasons and the additional features they recite.

Thus, Applicant respectfully submits that claims 2-4, 6-19, 22, and 24-26, 28-29 and 31-32 define patentable subject matter over the prior art of record. Please charge any additional fees or credit overpayment to the Deposit Account of McAndrews, Held & Malloy, Ltd., Account No. 13-0017.

Respectfully submitted,
McANDREWS, HELD & MALLOY, LTD.

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APPENDIX A
VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Claim 1 has been canceled without prejudice or disclaimer.

2. (Amended) [The method of Claim 1] A method of releasing energy comprising the steps of providing an electrolyte having a catalyst therein, the catalyst being suitable for initiating transitions of hydrogen and/or deuterium atoms in the electrolyte to a sub-ground energy state, and generating a plasma discharge in the electrolyte, wherein the plasma discharge is generated by applying a voltage across electrodes in the electrolyte of at least approximately 50V.